The laws of light and shade upon opaque bodies are very simple and very absolute; and one of the most rudimentary of them is, that every body has its light, its shade, and its shadow, the relations between which are constant; and that the most conspicuous and persistent edge or limit in this association of elements is the boundary of the shadow; the shadow being radically different from the shade in that its intensity is uniform throughout in any given instance, and is not affected by the form of the surface on which it is cast, whereas the shade is distinguished by attributes of an opposite character.

Now if the dark spaces adjoining the light patches on *Jupiter*, which I have called shadows, are not shadows at all, but shades, it is obvious that the opaque surface of the planet on which the shadows should fall is concealed; whereas if they are shadows, their boundaries are so soft and undefined, as to lead to the conclusion that they are cast upon a semi-transparent body, which allows the shadow to be seen indeed, but with diminishing distinctness towards its edge, according to the acuteness of its angle of incidence.

Either explanation of the phenomenon may be the true one, but they both lead to the same conclusion, viz., that neither the dark belts nor the bright ones are opaque, and that if *Jupiter* has any nucleus at all, it is not visible to us.

It is obvious that the phenomenon I have described would not be visible at the time of the planet's opposition, and the first occasion on which I noticed it was the night of the 16th of April last. The drawing* which accompanies this memorandum represents that particular observation; but since that date I have seen it even more distinctly on several occasions, and I venture to remark, that the time of opposition may prove to be as unfavourable for examining *Jupiter* as it is for the Moon.

The instrument used was a $9\frac{1}{4}$-inch silvered reflector, with achromatic eye-pieces; the power usually found most effective being 400.

By the kind invitation of Mr. Lassell, I had an opportunity on the 20th of April of examining the disk with his 20-foot reflector of 24 inches aperture, and I found this large instrument confirm my impressions concerning the shadows in the most satisfactory manner.

38 *Harley Street, W.*

Bright Spots on Jupiter. By Joseph Gledhill, Esq., F.G.S.

These curious and beautiful objects were finely seen here about midnight, April 23rd. They lay just within the shading which surrounded the south pole of *Jupiter*. Only three were seen. They seemed quite round, about the size of Sat. I., when fairly

* This drawing was exhibited at the Meeting.—Ed.

within the disk, were sharply defined, and quite as bright as any of the bright parts of the surface of the planet.

To the east of them there was a "break" or "gap" in the northern edge of the shading about the pole; and, on looking over the sketches and notes made here since 1869, I find that these spots have always, perhaps, been accompanied by a "gap" in the dusky band in which they lay. Sometimes the spots preceded the "gap" in position; sometimes they followed it; and occasionally some lay on both sides of it.

This double phenomenon was observed here in November and December 1869, in January, October, and November 1870, in January 1872; and now it appears again.

I believe that such bright spots have but rarely been seen to the north of the equator of *Jupiter*.

Mr. Edward Crossley's Observatory,
Skircoat, Halifax,
1874, *April* 24.

Discovery of Minor Planet (137).

This planet was discovered by M. Palisa, at Pola, on April 21st, its position being—

		Mean Time at Pola. h m	R.A. h m s	N.P.D. ° ′
1874	April 21	11 56	13 20 16	98 17

An observation made at Berlin on the following day gave—

	Mean Time at Berlin. h m	R.A. h m s	N.P.D. ° ′
April 22	10 7	13 19 38	98 9·4

The planet was of the 12th magnitude.

Discovery and Elements of Comet II. 1874, *and Comet III.* 1874.

The first of these Comets was discovered by Dr. Winnecke, at Strasburg, on April 11th, its position being—

		Mean Time at Strasburg. h m	Apparent R.A. h m s	Apparent N.P.D. ° ′
1874	April 11	15 30	21 23 8	96 56

From observations made at Kremsmünster and Vienna on